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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,536	08/20/2003	Ming-Yeh Chuang	TI-36215	6530
23494	7590	09/17/2004	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			OWENS, DOUGLAS W	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 09/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/644,536	CHUANG ET AL.	
	Examiner	Art Unit	
	Douglas W Owens	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,5,7,9,14,16,17 and 21 is/are rejected.
- 7) ☒ Claim(s) 2-4,6,8,10-13,15 and 18-20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/20/03</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

1. Claims 4, 5, 6, 11 and 12 are objected to because of the following informalities:
in line 3 of claim 4, "1e-10" should be replaced with --1E10--;
in line 1 of claim 5, --said-- should be inserted between "wherein" and "first";
in line 2 of claim 6, "6e15" should be replaced with --6E15--;
in line 4 of claim 6, "5e19" should be replaced with --5E19--;
in line 3 of claim 11, "of." should be replaced with --of--; and
in line 3 of claim 12, "1e-10" should be replaced with --1E10--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 5, 7, 9, 14 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,907,179 to Losehand et al.

Regarding claim 1, Losehand et al. teach a diode (Figs. 1 and 2, for example), comprising:

a substrate (2) doped with a first type dopant (Col. 4, lines 44 – 47); and

a double implanted guard ring (7; Col. 2, lines 9 – 14) located with said substrate and doped with a second type dopant and having a first doped profile region (15) and a second doped profile region (16).

Regarding claim 5 Losehand et al. teach a diode, wherein the first doped region has a doping concentration less than said second doped profile (Col. 5, lines 4 – 9).

Regarding claim 7, Losehand et al. teach a diode, wherein the second doped region is located within the first doped region.

Regarding claim 9, Losehand et al. teach a method of fabricating a diode, comprising:

doping a substrate with a first type dopant (Col. 4, lines 44 – 47); and
forming a double implanted guard ring (7; Col. 2, lines 9 – 14) within said substrate by doping with a second type dopant opposite said first type dopant to form a first doped profile region (15) and a second doped profile region (16).

Regarding claim 14, Losehand et al. teach a method, wherein the first doped profile has a doping concentration less than a doping concentration of the second doped region (Col. 5, lines 4 – 9).

Regarding claim 16, Losehand et al. teach a method, wherein the second doped region is located within the first doped region.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 17 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent Application Publication No. 2004/0150072 to Schnitt et al. in view of Losehand et al.

Regarding claim 17, Schnitt et al. teach an integrated circuit, comprising:

CMOS transistors, bipolar transistors, diodes and interconnects that interconnect said CMOS transistors, bipolar transistors and diodes to form an operative integrated circuit (paragraph [0021]).

Schnitt et al. do not teach an integrated circuit, wherein each diode includes:

- a substrate doped with a first type dopant;
- an electrode located over the substrate;
- an isolation region located adjacent the electrode; and
- a guard ring located with said substrate and doped with a second type dopant opposite the first type dopant and having a first doped profile region and a second doped profile region, wherein said second doped profile region is located at least partially within said first doped profile region.

Losehand et al. teach a diode comprising:

- a substrate doped with a first type dopant;
- an electrode located over the substrate;
- an isolation region located adjacent the electrode; and
- a guard ring located with said substrate and doped with a second type dopant opposite the first type dopant and having a first doped profile region and a second

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doped profile region, wherein said second doped profile region is located at least partially within said first doped profile region. It would have been obvious to one of ordinary skill in the art to incorporate the diode taught by Losehand et al. into the integrated circuit taught by Schnitt et al., since it is desirable to use diodes having reduced leakage currents.

Regarding claim 21, Schnitt et al. do not teach an integrated circuit, wherein the first doped region has a doping concentration less than a doping concentration of the second doped region. Losehand et al. teach an integrated circuit, wherein the first doped region has a doping concentration less than a doping concentration of the second doped region. It would have been obvious to one of ordinary skill in the art to incorporate the teaching of Losehand et al. into the teaching of Schnitt et al. for reasons discussed above.

Allowable Subject Matter

6. Claims 2 – 4, 6, 8, 10 – 13, 15 and 18 – 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W Owens whose telephone number is 571-272-1662. The examiner can normally be reached on Monday-Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Douglas W. Owens". The signature is fluid and cursive, with the first name "Douglas" being the most prominent part.

Douglas W. Owens
Patent Examiner